Amendments to the Claims

Claim 1 **(Currently Amended)** An information recording medium having at least two information layers, the information recording medium comprising:

a first information layer including a first recording layer ~~that generates~~ in which a reversible phase change between ~~the~~ a crystalline phase and ~~the~~ an amorphous phase is caused by optical means or electrical means; and

a second information layer including a second recording layer ~~that generates~~ in which a reversible phase change between ~~the~~ a crystalline phase and ~~the~~ an amorphous phase is caused by optical means or electrical ~~means;~~ means,

wherein the first recording layer contains Ge, Te and Bi, and

the second recording layer contains Sb and at least one element M1 selected from a group consisting of V, Mn, Ga, Ge, Se, Ag, In, Sn, Te, Pb, Bi and Au.

Claim 2 **(Original)** The information recording medium according to claim 1, wherein the first recording layer further contains Sb.

Claim 3 **(Previously Presented)** The information recording medium according to claim 1, wherein the first recording layer further contains Sn.

Claim 4 **(Previously Presented)** The information recording medium according to claim 1, wherein the first recording layer contains Bi at 1.0 atom % or more.

Claim 5 **(Original)** The information recording medium according to claim 1, wherein the first recording layer is represented by a composition formula $Ge_aBi_bTe_{3+a}$, where $0 < a \leq 60$ and $1.5 \leq b \leq 7$.

Claim 6 **(Original)** The information recording medium according to claim 1, wherein the first recording layer is represented by a composition formula $(Ge\text{-}M2)_aBi_bTe_{3+a}$, where M2 is at least one element selected from a group consisting of Sn and Pb, and $0 < a \leq 60$ and $1.5 \leq b \leq 7$.

Claim 7 **(Original)** The information recording medium according to claim 2, wherein the first recording layer is represented by a composition formula $Ge_a(Bi\text{-}Sb)_bTe_{3+a}$, where $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 8 **(Currently Amended)** The information recording medium according to claim 2, wherein the first recording layer is represented by a composition formula $(Ge\text{-}M2)_a(Bi\text{-}Sb)_bTe_{3+a}$, where M2 is at least one element selected from a group consisting of Sn and Pb, and $0 < a \leqq 60$ and $1.5 \leqq b \leqq$ ~~7)~~ 7.

Claim 9 **(Currently Amended)** An information recording medium having at least two information layers, the information recording medium comprising:

a first information layer including a first recording layer ~~that generates~~ in which a reversible phase change between ~~the~~ a crystalline phase and ~~the~~ an amorphous phase is caused by optical means or electrical means; and

a second information layer including a second recording layer ~~that generates~~ in which a reversible phase change between ~~the~~ a crystalline phase and ~~the~~ an amorphous phase is caused by optical means or electrical ~~means;~~ means,

wherein the first recording layer contains Ge, Te and Sb, and

the second recording layer contains Sb and at least one element M1 selected from a group consisting of V, Mn, Ga, Ge, Se, Ag, In, Sn, Te, Pb, Bi and Au.

Claim 10 **(Original)** The information recording medium according to claim 9, wherein the first recording layer is represented by a composition formula $Ge_aSb_bTe_{3+a}$, where $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 11 **(Original)** The information recording medium according to claim 9, wherein the first recording layer is represented by a composition formula $(Ge\text{-}M2)_aSb_bTe_{3+a}$, where M2 is at least one element selected from a group consisting of Sn and Pb, and $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 12 **(Previously Presented)** The information recording medium according to claim 1, wherein the second recording layer is represented by a composition formula Sb_xM1_{100-x}, where $50 \leqq x \leqq 95$ atom %.

Claim 13 **(Previously Presented)** The information recording medium according to claim 1, wherein the second recording layer is represented by a composition formula Sb_yM1_{100-y}, where $0 < y \leqq 20$ atom %.

Claim 14 **(Previously Presented)** The information recording medium according to claim 1, wherein the second recording layer is represented by a composition formula $Ge_a(Bi\text{-}Sb)_bTe_{3+a}$, where $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 15 **(Previously Presented)** The information recording medium according to claim 1, wherein the second recording layer is represented by a composition formula $(Ge\text{-}M2)_a(Bi\text{-}Sb)_bTe_{3+a}$, where M2 is at least one element selected from a group consisting of Sn and Pb, and $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 16 **(Currently Amended)** An information recording medium having at least two information layers, the information recording medium comprising:

a first information layer including a first recording layer ~~that generates~~ in which a reversible phase change between ~~the~~ a crystalline phase and ~~the~~ an amorphous phase is caused by optical means or electrical means; and

a second information layer including a second recording layer ~~that generates~~ in which a reversible phase change between ~~the~~ a crystalline phase and ~~the~~ an amorphous phase is caused by optical means or electrical ~~means;~~ means,

wherein both the first recording layer and the second recording layer contain Ge, Te and Bi, and

wherein at least one of the first recording layer and the second recording layer contains Bi at 1.0 atom % or more.

Claim 17 **(Canceled)**

Claim 18 **(Original)** The information recording medium according to claim 16, wherein at least one of the first recording layer and the second recording layer is represented by a composition formula $Ge_aBi_bTe_{3+a}$, where $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 19 **(Original)** The information recording medium according to claim 16, wherein at least one of the first recording layer and the second recording layer is represented by a composition formula $(Ge\text{-}M2)_aBi_bTe_{3+a}$, where M2 is at least one element selected from a group consisting of Sn and Pb, and $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 20 **(Previously Presented)** The information recording medium according to claim 1, further comprising an interface layer that is provided adjacent to a surface of at least one of the first recording layer and the second recording layer, wherein the interface layer contains at least one composition selected from a group consisting of Ga_2O_3, SnO_2, ZrO_2, HfO_2, Nb_2O_5, Ta_2O_5, SiO_2, Cr_2O_3, Al_2O_3, TiO_2, ZnO, Zr-N, Hf-N, Nb-N, Ta-N, Si-N, Cr-N, Ge-N, Al-N, Ge-Si-N, Ge-Cr-N, YF_3, LaF_3, CeF_3, GdF_3, DyF_3, ErF_3, YbF_3, C and ZnS.

Claim 21 **(Currently Amended)** The information recording medium according to claim 1, wherein the first information layer includes at least a first incident side dielectric layer, a first incident side interface layer, ~~a~~ the first recording layer, a first counterincident side interface layer, a first reflection layer and a transmittance adjustment layer in this order.

Claim 22 **(Currently Amended)** The information recording medium according to claim 1, wherein the second information layer includes at least a second incident side dielectric layer, a second incident side interface layer, ~~a~~ the second recording layer, a second counterincident side interface layer, a second counterincident side dielectric layer and a second reflection layer in this order.

Claim 23 **(Currently Amended)** The information recording medium according to claim 1, wherein the first information layer is disposed at ~~the optical means~~ a side closer to the optical means or the electrical means than ~~with respect to~~ the second information layer.

Claim 24 **(Currently Amended)** The information recording medium according to claim 1, wherein a thickness of the first recording layer is 9 nm or less.

Claim 25 **(Currently Amended)** The information recording medium according to claim 1, wherein a thickness of the second recording layer is between 6 and 15 nm.

Claim 26 **(Currently Amended)** A method for producing an information recording medium having at least two information layers on a substrate, the method comprising ~~the steps of~~:

forming a first recording layer that is ~~generates a~~ phase ~~change~~ changeable; and

forming a second recording layer that ~~generates a~~ is phase ~~change;~~ changeable,

wherein a sputtering target containing Ge, Te and Bi is used in the forming of the first recording ~~layer forming step;~~ layer, and

a sputtering target containing Sb and at least one element M1 selected from a group consisting of V, Mn, Ga, Ge, Se, Ag, In, Sn, Pb, Te, Bi and Au is used in the forming of the second recording layer ~~forming step~~.

Claim 27 **(Currently Amended)** The method for producing an information recording medium according to claim 26, wherein the sputtering target that is used in the forming of the first recording layer ~~forming step~~ further contains Sb.

Claim 28 **(Currently Amended)** The method for producing an information recording medium according to claim 26, wherein the sputtering target that is used in the forming of the first recording layer ~~forming step~~ further contains Sn.

Claim 29 **(Currently Amended)** The method for producing an information recording medium according to claim 26, wherein ~~a~~ the sputtering target ~~containing~~ used in the forming of the first recording layer contains Bi at 0.5 atom % or more ~~is used in the first recording layer forming step~~.

Claim 30 **(Currently Amended)** The method for producing an information recording medium according to claim 26, wherein the first recording layer that is formed by the sputtering target that is used in the forming of the first recording layer ~~forming step~~ is represented by a composition formula $Ge_aBi_bTe_{3+a}$, where $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 31 **(Currently Amended)** The method for producing an information recording medium according to claim 26, wherein the first recording layer that is formed by the sputtering target that is used in the forming of the first recording layer ~~forming step~~ is represented by a composition formula $(Ge\text{-}M2)_aBi_bTe_{3+a}$, where M2 is at least one element selected from a group consisting of Sn and Pb, and $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 32 **(Currently Amended)** The method for producing an information recording medium according to claim 27, wherein the first recording layer that is formed by the sputtering target that is used in the forming of the first recording layer ~~forming step~~ is represented by a composition formula $Ge_a(Bi\text{-}Sb)_bTe_{3+a}$, where $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 33 **(Currently Amended)** The method for producing an information recording medium according to claim 27, wherein the first recording layer that is formed by the sputtering target that is used in the forming of the first recording layer ~~forming step~~ is represented by a composition formula $(Ge\text{-}M2)_a(Bi\text{-}Sb)_bTe_{3+a}$, where M2 is at least one element selected from a group consisting of Sn and Pb, and $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$).

Claim 34 **(Currently Amended)** A method for producing an information recording medium that has at least two information layers, the method comprising ~~the steps of~~:

forming a first recording layer that ~~generates a~~ is phase ~~change~~ changeable; and

forming a second recording layer that ~~generates a~~ is phase ~~change;~~ changeable,

wherein a sputtering target containing Ge, Te and Sb is used in the forming of the first recording ~~layer forming step;~~ layer, and

a sputtering target containing Sb and at least one element M1 selected from a group consisting of V, Mn, Ga, Ge, Se, Ag, In, Sn, Pb, Te, Bi and Au is used in the forming of the second recording layer ~~forming step~~.

Claim 35 **(Currently Amended)** The method for producing an information recording medium according to claim 34, wherein the first recording layer that is formed by the sputtering target that is used in the forming of the first recording layer ~~forming step~~ is represented by a composition formula $Ge_aSb_bTe_{3+a}$, where $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 36 **(Currently Amended)** The method for producing an information recording medium according to claim 34, wherein the first recording layer that is formed by the sputtering target that is used in the forming of the first recording layer ~~forming step~~ is represented by a composition formula $(Ge\text{-}M2)_aSb_bTe_{3+a}$, where M2 is at least one element selected from a group consisting of Sn and Pb, and $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 37 **(Currently Amended)** The method for producing an information recording medium according to claim 26, wherein the second recording layer that is formed by the sputtering target that is used in the forming of the second recording layer ~~forming step~~ is represented by a composition formula Sb_xM1_{100-x}, where $50 \leqq x \leqq 95$ atom %.

Claim 38 **(Currently Amended)** The method for producing an information recording medium according to claim 26, wherein the second recording layer that is formed by the sputtering target that is used in the forming of the second recording layer ~~forming step~~ is represented by a composition formula Sb_yM1_{100-y}, where $0 < y \leqq 20$ atom %.

Claim 39 **(Currently Amended)** The method for producing an information recording medium according to claim 26, wherein the second recording layer that is formed by the sputtering target that is used in the forming of the second recording layer ~~forming step~~ is represented by a composition formula $Ge_a(Bi\text{-}Sb)_bTe_{3+a}$, where $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 40 **(Currently Amended)** The method for producing an information recording medium according to claim 26, wherein the second recording layer that is formed by the sputtering target that is used in the forming of the second recording layer ~~forming step~~ is represented by a

composition formula $(Ge\text{-}M2)_a(Bi\text{-}Sb)_bTe_{3+a}$, where M2 is at least one element selected from a group consisting of Sn and Pb, and $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 41 **(Currently Amended)** A method for producing an information recording medium that has at least two information layers, the method comprising ~~the steps of~~:

forming a first recording layer that ~~generates a~~ is phase ~~change~~ changeable; and

forming a second recording layer that ~~generates a~~ is phase ~~change;~~ changeable,

wherein a sputtering target containing Ge, Te and Bi is used in both the forming of the first recording layer ~~forming step~~ and the forming of the second recording layer ~~forming step~~, and

wherein the sputtering target used in the forming of the second recording layer contains Bi at 0.5 atom % or more.

Claim 42 **(Canceled)**

Claim 43 **(Currently Amended)** The method for producing an information recording medium according to claim 41, wherein the second recording layer that is formed by the sputtering target that is used in the forming of the second recording layer ~~forming step~~ is represented by a composition formula $Ge_aBi_bTe_{3+a}$, where $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 44 **(Currently Amended)** The method for producing an information recording medium according to claim 41, wherein the second recording layer that is formed by the sputtering target that is used in the forming of the second recording layer ~~forming step~~ is represented by a composition formula $(Ge\text{-}M2)_aBi_bTe_{3+a}$, where M2 is at least one element selected from a group consisting of Sn and Pb, and $0 < a \leqq 60$ and $1.5 \leqq b \leqq 7$.

Claim 45 **(Previously Presented)** The information recording medium according to claim 9, wherein the second recording layer is represented by a composition formula Sb_xM1_{100-x}, where $50 \leqq x \leqq 95$ atom %.

Claim 46 **(Previously Presented)** The information recording medium according to claim 9, wherein the second recording layer is represented by a composition formula Sb_yM1_{100-y}, where $0 < y \leq 20$ atom %.

Claim 47 **(Previously Presented)** The information recording medium according to claim 9, wherein the second recording layer is represented by a composition formula $Ge_a(Bi\text{-}Sb)_bTe_{3+a}$, where $0 < a \leq 60$ and $1.5 \leq b \leq 7$.

Claim 48 **(Previously Presented)** The information recording medium according to claim 9, wherein the second recording layer is represented by a composition formula $(Ge\text{-}M2)_a(Bi\text{-}Sb)_bTe_{3+a}$, where M2 is at least one element selected from a group consisting of Sn and Pb, and $0 < a \leq 60$ and $1.5 \leq b \leq 7$.

Claim 49 **(Previously Presented)** The information recording medium according to claim 9, further comprising an interface layer that is provided adjacent to a surface of at least one of the first recording layer and the second recording layer, wherein the interface layer contains at least one composition selected from a group consisting of Ga_2O_3, SnO_2, ZrO_2, HfO_2, Nb_2O_5, Ta_2O_5, SiO_2, Cr_2O_3, Al_2O_3, TiO_2, ZnO, Zr-N, Hf-N, Nb-N, Ta-N, Si-N, Cr-N, Ge-N, Al-N, Ge-Si-N, Ge-Cr-N, YF_3, LaF_3, CeF_3, GdF_3, DyF_3, ErF_3, YbF_3, C and ZnS.

Claim 50 **(Previously Presented)** The information recording medium according to claim 16, further comprising an interface layer that is provided adjacent to a surface of at least one of the first recording layer and the second recording layer, wherein the interface layer contains at least one composition selected from a group consisting of Ga_2O_3, SnO_2, ZrO_2, HfO_2, Nb_2O_5, Ta_2O_5, SiO_2, Cr_2O_3, Al_2O_3, TiO_2, ZnO, Zr-N, Hf-N, Nb-N, Ta-N, Si-N, Cr-N, Ge-N, Al-N, Ge-Si-N, Ge-Cr-N, YF_3, LaF_3, CeF_3, GdF_3, DyF_3, ErF_3, YbF_3, C and ZnS.

Claim 51 **(Currently Amended)** The information recording medium according to claim 9, wherein the first information layer includes at least a first incident side dielectric layer, a first incident side interface layer, ~~a~~ the first recording layer, a first counterincident side interface layer, a first reflection layer and a transmittance adjustment layer in this order.

Claim 52 **(Currently Amended)** The information recording medium according to claim 16, wherein the first information layer includes at least a first incident side dielectric layer, a first incident side interface layer, ~~a~~ the first recording layer, a first counterincident side interface layer, a first reflection layer and a transmittance adjustment layer in this order.

Claim 53 **(Currently Amended)** The information recording medium according to claim 9, wherein the second information layer includes at least a second incident side dielectric layer, a second incident side interface layer, ~~a~~ the second recording layer, a second counterincident side interface layer, a second counterincident side dielectric layer and a second reflection layer in this order.

Claim 54 **(Currently Amended)** The information recording medium according to claim 16, wherein the second information layer includes at least a second incident side dielectric layer, a second incident side interface layer, ~~a~~ the second recording layer, a second counterincident side interface layer, a second counterincident side dielectric layer and a second reflection layer in this order.

Claim 55 **(Currently Amended)** The information recording medium according to claim 9, wherein the first information layer is disposed at ~~the optical means~~ a side closer to the optical means or the electrical means than ~~with respect to~~ the second information layer.

Claim 56 **(Currently Amended)** The information recording medium according to claim 16, wherein the first information layer is disposed at ~~the optical means~~ a side closer to the optical means or the electrical means than ~~with respect to~~ the second information layer.

Claim 57 **(Currently Amended)** The information recording medium according to claim 9, wherein a thickness of the first recording layer is 9 nm or less.

Claim 58 **(Currently Amended)** The information recording medium according to claim 16, wherein a thickness of the first recording layer is 9 nm or less.

Claim 59 **(Currently Amended)** The information recording medium according to claim 9, wherein a thickness of the second recording layer is between 6 and 15 nm.

Claim 60 **(Currently Amended)** The information recording medium according to claim 16, wherein a thickness of the second recording layer is between 6 and 15 nm.

Claim 61 **(Currently Amended)** The method for producing an information recording medium according to claim 34, wherein the second recording layer that is formed by the sputtering target that is used in the forming of the second recording layer ~~forming step~~ is represented by a composition formula Sb_xM1_{100-x}, where $50 \leq x \leq 95$ atom %.

Claim 62 **(Currently Amended)** The method for producing an information recording medium according to claim 34, wherein the second recording layer that is formed by the sputtering target that is used in the forming of the second recording layer ~~forming step~~ is represented by a composition formula Sb_yM1_{100-y}, where $0 < y \leq 20$ atom %.

Claim 63 **(Currently Amended)** The method for producing an information recording medium according to claim 34, wherein the second recording layer that is formed by the sputtering target that is used in the forming of the second recording layer ~~forming step~~ is represented by a composition formula $Ge_a(Bi\text{-}Sb)_bTe_{3+a}$, where $0 < a \leq 60$ and $1.5 \leq b \leq 7$.

Claim 64 **(Currently Amended)** The method for producing an information recording medium according to claim 34, wherein the second recording layer that is formed by the sputtering target that is used in the forming of the second recording layer ~~forming step~~ is represented by a composition formula $(Ge\text{-}M2)_a(Bi\text{-}Sb)_bTe_{3+a}$, where M2 is at least one element selected from a group consisting of Sn and Pb, and $0 < a \leq 60$ and $1.5 \leq b \leq 7$.